



Take font.

And now, a brief homage to the Vidifont.

Let me pay my respects to the device that, for the first time, allowed proportionally-spaced, electronically-generated type to be drawn on the NTSC screen on demand.

Click on each of the images below to see at a larger size, and be sure to follow the links to a couple of other sites that give you a more complete picture of what the Vidifont was designed to do in a time when broadcast television was way more analog than digital.



No, I'm not ignoring the Chyron (or Chiron), but I have to take a moment here to share one of my prized chunks of early television nostalgia...a brochure for the device that first gave me hope that there was a way to display type on TV that didn't involve shooting it off off a black card with a camera.

The Vidifont. The original model, from CBS Labs, which became Thomson CSF Labs, which became, well, I've lost count. It's true that I did most of my work on the Vidifont IV ([here's the actual unit](#) I used at Atlanta's WTCG in the late 1970s), but

my fascination with TV graphics began with this device.

Two hard-wired fonts, big and small, and by the way, the small one's all caps.

Here's a fascinating first-hand report written by Stanley Baron, one of the principal designers of the system at CBS Labs, on how the Vidifont came to be.

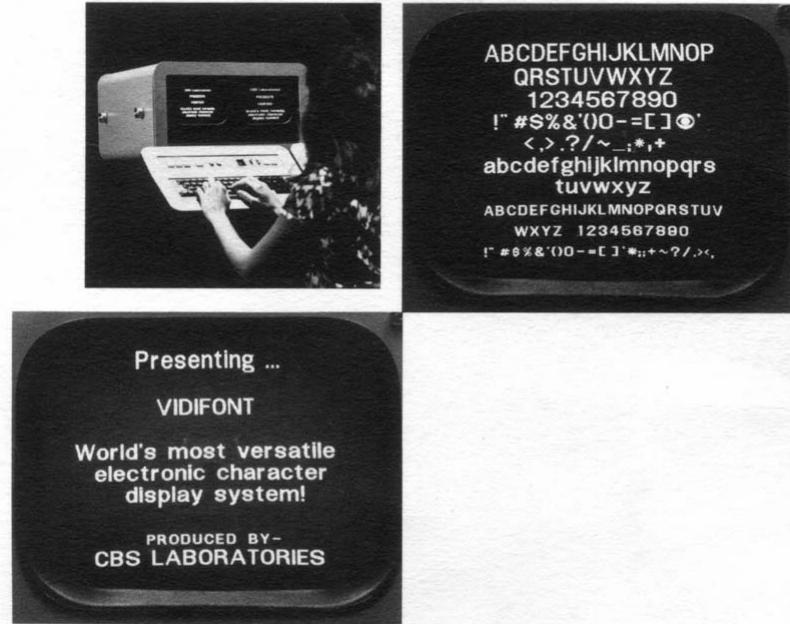
He covers a couple of key design goals and how they were achieved: first of all, proportional fonts, where the width of an 'M' was wider than the width of an 'I.' (Mr. Baron holds a patent on the approach used, where "timing codes" corresponding to the width of characters told the machine where—or, more accurately, when—to begin drawing the next digital letter on the line.)

He also details the economic considerations involved, where CBS basically determined they were spending so much money creating 35mm slides for namesupers (the hardware costs for the specialized camera itself were considerable) that they could easily recoup that and more by developing the Vidifont. It's a classic story where other companies said it couldn't be done, and Mr. Baron said "well, I see a way."

Here's an excerpt from one of the brochure's documents:

The Vidifont system is a television titling system designed to eliminate the need for artwork or menu-board titling by providing the user with electronically-generated, instantly-available, quality characters. A complete Vidifont system consists of a basic Vidifont package, a storage system and miscellaneous accessories or options.

In Vidifont systems, fonts are stored in semiconductor read-only-memories (ROMs), factory-installed in the Vidifont. A basic ROM system includes a 28 scan-line high set of upper-case characters of proportional widths (CBS News 36). There are 62 letters, numbers, punctuation marks, and symbols in the set. Other ROM fonts are available as options.



journal article in the 1971 edition of **The Journal of Typographical Research** on 'The Development of Vidifont,' which examines (more than the hardware itself) the inherent challenges of making type readable onscreen in the (about to be obsolete) NTSC television system. (Thanks to **Dana M. Lee**, formerly of CITY-TV in Ontario.)



The system allows display of up to 16 lines — or rows — of characters with as many as 32 characters per row. Because of proportionally-spaced characters, the actual number per line will vary.

The basic system features two speeds of roll and crawl, three speeds of flash, as well as four-position pushbutton tabs and centering. The capability to colorize (word by word) and edge is built in, and may be tied to the optional Colorizer Keyer.

The basic system consists of at least three units, the Display Control Unit, Power Supply, and Composer Keyboard. The Display Control Unit (DCU) is a rack-mounted unit containing all the logic and memory circuitry to produce the electronic characters.

Here's a scanned PDF of Rudi Bass's

[scanned PDF](#) of Rudi Bass's

[journal article](#) in the 1971 edition of **The Journal of Typographical Research** on 'The Development of Vidifont.'

[Read the article](#)

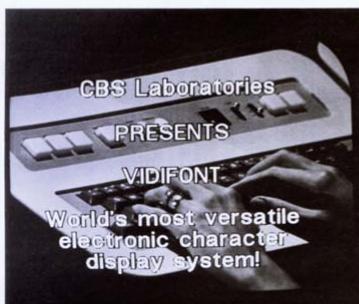
CBS LABORATORIES

APPLICATIONS BULLETIN

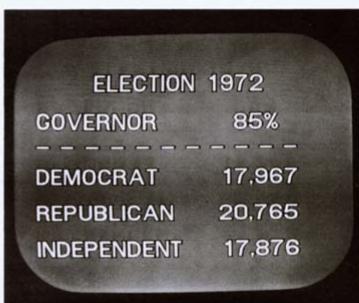


VIDIFONT -
FOR PRIMARY AND ELECTION COVERAGE

PROFESSIONAL PRODUCTS
CBS LABORATORIES
A DIVISION OF COLUMBIA
BROADCASTING SYSTEM, INC.



PRE-AIR FORMATTING



CBS LABORATORIES

A Division of Columbia Broadcasting System, Inc.
High Ridge Road
Stamford, Connecticut 06905
(203) 327-2000

VIDIFONT SYSTEM GUIDE

GENERAL INFORMATION

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BASIC VIDIFONT SYSTEM

In Vidifont systems, fonts are stored in semiconductor read-only-memories (ROM's), factory-installed in the Vidifont. A basic ROM system includes a 28 scan-line, high set of upper-case characters of proportional widths (CBS News 36). There are 62 letters, numbers, punctuation marks and symbols in the set. Other ROM fonts are available as options.

The system allows display of up to 16 lines - or rows - of characters with as many as 32 characters per row. Because of proportionally spaced characters, the actual number per line will vary.

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The basic system consists of at least three units, the Display Control Unit, Power Supply, and Composer Keyboard. The Display Control Unit (DCU) is a rack-mounted unit containing all of the logic and memory circuitry to produce the electronic characters.

the system

Provides character graphics in a TV compatible signal format without the need of a camera.

fonts

user list/applications

Vidifont

USER LIST

KAKE-TV	Wichita, Kan.	WFAA-TV	Dallas, Tex.
KARD-TV	Wichita, Kan.	WFBC-TV	Greenville, S.C.
KATU	Portland, Ore.	WFMY-TV	Greensboro, N.C.
KCPX-TV	Salt Lake City, Utah	WGBH-TV	Boston, Mass.
KCRA-TV	Sacramento, Cal.	WGR-TV	Buffalo, N.Y.
KCST	San Diego, Cal.	WHA-TV	Madison, Wis.
KERA-TV	Dallas, Tex.	WHAS-TV	Louisville, Ky.
KGTV	San Diego, Cal.	WHBQ-TV	Memphis, Tenn.
KGO-TV	San Francisco, Calif.	WITI-TV	Milwaukee, Wis.
KING-TV	Seattle, Wash.	WJBF-TV	Augusta, Ga.
KIRO-TV	Seattle, Wash.	WJIM-TV	Lansing, Mich.
KLFY-TV	Lafayette, La.	WKBW-TV	Buffalo, N.Y.
KMGH-TV	Denver, Colo.	WKY-TV	Oklahoma City, Okla.
KOCE-TV	Huntington Beach, Cal.	WLWC	Columbus, Ohio
KOMO-TV	Seattle, Wash.	WLWD	Dayton, Ohio
KOOL-TV	Phoenix, Ariz.	WLWT	Cincinnati, Ohio
KROD-TV	El Paso, Tex.	WMAL-TV	Washington, D.C.
KSL-TV	Salt Lake City, Utah	WMC-TV	Memphis, Tenn.
KTBV-TV	Shreveport, La.	WMPB	Baltimore, Md.
KTEW-TV	Tulsa, Okla.	WNAC-TV	Boston, Mass.
KTLA	Los Angeles, Cal.	WNBC-TV	New York-Newark
KTRK-TV	Houston, Tex.	WOAI-TV	San Antonio, Tex.
KTVH	Hutchinson, Kan.	WOED	Pittsburgh, Pa.
KTVK-TV	Phoenix, Ariz.	WRAL-TV	Raleigh, N.C.
KUON-TV	Lincoln, Neb.	WRTV	Indianapolis, Ind.
KWTV	Oklahoma City, Okla.	WSAZ-TV	Huntington, W. Va.
KWTX-TV	Waco, Tex.	WTAR-TV	Norfolk, Va.
WALA-TV	Mobile, Ala.	WTNH-TV	New Haven, Conn.
WAPA-TV	San Juan, P.R.	WTOM	Meridian, Miss.
WATE-TV	Knoxville, Tenn.	WTVD	Durham, N.C.
WAVE-TV	Louisville, Ky.	WTVJ	Miami, Fla.
WAVY-TV	Portsmouth, Va.	WWJ-TV	Detroit, Mich.
WBEN-TV	Buffalo, N.Y.	WXEX-TV	Petersburg, Va.
WBIR-TV	Knoxville, Tenn.	WXIA-TV	Atlanta, Ga.
WBTV	Charlotte, N.C.	WXII	Winston-Salem, N.C.
WCAX-TV	Burlington, Vt.		
WCCO-TV	Minneapolis, Minn.		
WCPO-TV	Cincinnati, Ohio		
WCVE-TV	Richmond, Va.		
WDAF-TV	Kansas City, Mo.		
WEA-TV	Washington, D.C.		
WEWS	Cleveland, Ohio		

APPLICATIONS

fonts

Vidifont

28-Line Upper Case (CBS News 36)

28-Line Lower Case (CBS News 36)

18-Line Upper Case (CBS News 36)

28 Line U.C.-i ï N

28 Line L.C.-á é í ó ú n

18 Line U.C.-ñ i ï

Special Characters (Spanish Font)

28-Line Upper Case Centurion

28-Line Upper Case Italicized Centurion

Custom fonts are available on special order.

the system

Provides character graphics in a TV compatible signal format without the need of a camera.

Colorizer/Keyer
Encodes the DCU, RGB, and incoming video, and performs character edging.

Power Supply
Provides power to the DCU, Vidicord, and Composer Keyboard.

Display Control Unit (DCU)
Contains character generator logic circuitry.

Vidicord
Allows pre-program preparation, storage, and later recall of character graphics. (See reverse side.)

Composer Keyboard
Controls composition and editing functions.

Address Keyboard
Controls storage and recall of titling information, and contains colorizer controls.



Vidicord bulk storage unit used with the Vidifont System incorporates all these desirable operating characteristics in one unit:

- Large storage capacity
- Removable cartridge
- Fast access time

Vidicord offers:

- Capability of storing 10,000 addresses, or up to 240,000 characters at 24 characters per address
- Single, self-threading removable cartridge utilizing a 3-inch reel of 1/4-inch magnetic tape
- Mechanical interlock to prevent accidental erasure of stored data
- Fast access to each of the 10 sectors of stored information. Within each sector of 1,000 addresses, any message can be located and recalled in an average time of 3/10 of a second
- Priced competitively at a very low cost per character

specifications

Vidifont

Display Format and Capacity

Format: One or more horizontal rows (lines) of typographically superior alpha-numerical characters, punctuation marks, and other symbols; rows can be placed at desired vertical levels and typically can be used for "page" presentations.

Capacity: One to 16 rows, each consisting of one to 32 characters (maximum number depends on fonts and characters used).

Time Display: Using optional Electronic Time Display ("clock") module, clock-time numerals can be displayed in hours, minutes, seconds, and tenths in a count-up or countdown. Numerals appear in a preselected row centered within the safe title area.

Graphic Features

Character Widths: Proportional. Characters are appropriately designed in 15 different widths*.

Edging: Character edging output provided as separate keying signal. (See OUTPUTS below)

Color: Available in seven hues for selection and presentation on word-by-word basis.

Flashing: Word-by-word flashing possible; three selectable rates.

Roll: Display can be vertically rolled; two selectable speeds.

Crawl: Display can be horizontally crawled from right to left on any row; two selectable speeds.

Character type faces: Three standard styles, one provided and two optional. All styles CBS News 36, and can be mixed within the same display.

Font 1 Upper Case: Standard character set provided: 26 upper case letters, 10 numbers, 22 punctuation symbols, and 3 space widths. Resolution defined by character height of 28 TV lines, and maximum character width equivalent to 64 matrix points (each matrix point equal to 45 nanoseconds).

Font 1 Lower Case: Pre-designed optional character set, with 26 lower case letters. Same resolution as Font 1 Upper case.

Font 2 Upper Case: Pre-designed optional character set, same characters as Font 1 Upper Case. Resolution defined by character height of 18 TV lines, and maximum character width equivalent to 43 matrix points.

Special Characters: Any font or individual character can be designed on special request.

*Among the three pre-designed character sets

†Available only when Vidicord is used as part of the system.

Control and Editing Features

Keyboard character entry—Full cursor positioning control—Character deletion or insertion with automatic spacing adjustment—Character replacement—Line deletion—Full page erase—Tab (four position), Tab set, and Tab change—Pushbutton line centering—Shift and Shift Lock—Record mark—Roll/Crawl* initiate and Pause—Roll/Crawl speed select (Fast and Slow)—Font 1 and Font 2 select—Color selection—Flash speed select (three speeds)—Time* (clock up or down), Timestep, Time disappear when counting or stopped, then reappear and maintain or continue the count.

Input Signals

Sync: 4V p-p (loop through) per EIA or CCIR standards.

Character Input: (Normally supplied from Vidifont Composer Keyboard or from optional Vidicord Storage system.) Eight-bit parallel modified USASCII code. Logical 1 = 0.0 to +0.8V; Logical 0 = +2.4 to +5.0V. Maximum input transfer rate 15,000 characters per second. Data must be accompanied by strobe pulse, 2 μ sec or wider. +2.4 to +5.0V positive peak, 0.0 to +0.8V negative peak. Maximum rise time, 1 μ sec. Data should not be changed during strobe time.

External Time Input: (Used with optional Electronic Time Display Module). Positive or negative pulse at 60 Hz rate, +2.4 to +5.0V positive peak, 0.0 to +0.8V negative peak. Maximum rise and fall times, 200 nanoseconds. Pulse duration must be at least 200 nanoseconds. (Internal Crystal can be used in lieu of EXT TIME input).

Outputs

Character Video: Four isolated and independent outputs:

Prev Vid 1: Composite video signal (monochrome) with composer markers (cursor, right hand border, and record mark). Output level = 1.0V p-p into 75 ohm load.

Prev Vid 2: Same as Prev Vid 1.

On Air Vid 1: Composite video signal (monochrome) without composer markers. Output level = 1.0V p-p into 75 ohm load.

On Air Vid 2: Same as On Air Vid 1. Output waveforms in accordance with 525 line 30 frame, EIA Standards RS-170, or 625 line 25 frame CCIR standards.

Keying Signal: One isolated non-composite Keying output for character edging. Output level = .7V p-p into 75 ohm load. Vertical edging (top and bottom) is two TV lines.

Color Control: Isolated non-composite R, G, B, Video outputs for use in feeding separate encoder or colorizer. Output level = .7V p-p into 75 ohm load.

*Available only when Vidicord is part of the system

†Optional feature

Power Requirements

115v \pm 10%, 47-63 Hz, 3.0 amperes (5 ampere surge)
220v \pm 10%, 47-63 Hz \pm 5%, 1.5 amperes (3 ampere surge)

Physical Specifications

Logic Drawer: 19 in. w x 5 $\frac{1}{4}$ in. h x 19 in. d, equipped with rack slides.

Power Supply: 19 in. w x 7 in. h x 19 in. d, equipped with rack slides.

Composer Keyboard: 18 in w x max 4 $\frac{1}{2}$ in. h x 10 $\frac{3}{4}$ in. d, desk or table mounting.

Combined weight: 111 lbs. maximum.

Connectors and Cables

Pulse and video inputs and outputs: BNC type UG 1094/U connectors; RG-59/U Cables recommended.

Data input/output/keyboard connectors: 37-pin, 50-pin, Amphenol Type HDP-20.

Data cables: Shield cables may be needed for runs exceeding 100 feet. Mohawk 22HF40-S or 22HF50-S or equivalent is suggested.

Environmental Specifications

Operating Range:

Temperature: 0° C (+32° F) to +50° C (+122° F)

Relative Humidity: 5% to 90% (without condensation)

Non-operating Range:

Temperature: -22° C (-30° F) to +80° C (+176°F)

Relative Humidity: 5% to 90% (without condensation)

CBS LABORATORIES
APPLICATIONS
BULLETIN



PBS tries shortcut to TV titling

By Jim Karayn, PBS, and
Walter Muckle, CBS Labs

■ The increasing use in television broadcasting of visual titles superimposed upon the video presentation of special events and news programs has presented a challenge for a long time to television research engineers for faster, better and less expensive means of producing the needed graphics. Various methods developed over the past 20 years have required many people and complex, expensive equipment—and a camera.

The introduction of computer display terminals a few years ago sparked various methods of using, in one form or another, computer characters for television titling.

The basic dot pattern, used in most computer graphic systems, simply was not adequate for regular home viewing. It lacked clarity as well as flexibility. Continued research evolved the stroke matrix. Strokes offer a distinct advantage over dot patterns by analyzing intersections on a line-to-line basis, instead of viewing the letters on a fixed-grid pattern or matrix.

Exhaustive studies into proper character height, shape, line-to-line spacing and other essentials enabled CBS Laboratories to develop a new system design concept, with the resultant production of a highly flexible and legible electronic character generator. This CBS Laboratories system is known as Vidifont.

Vidifont is designed to eliminate the major need for artwork or menu board titling—or a camera—by providing the broadcaster with instantly available electronically generated graphic looking characters, simply by pushing a few buttons.

Vidifont provides the user with two switch selected fonts or type sizes, each with proportional spacing. All characters assume their full spread and width. For instance, "WYS" occupies four times the space of "T".

The equipment configuration for the Vidifont is based on a modular concept for improved maintainability and reliability. The basic system is contained in a logic drawer 8.75 inches high, 19 inches wide and 19 inches deep.

Vidifont On NET

Vidifont was used recently on National Education Television's (NET) fast-paced *Homefront 71* network documentary. *Homefront 71*'s producer Jim Karayn, director Alvin Miflow and production

manager Jim Solt expressed their belief that this working demonstration of Vidifont's flexibility, clarity and versatility enables them to add to their home viewers' digestion of this highly informative program via the quality of the visual supers of questions put to panel members and of their answers—virtually a sophisticated version of "show and tell" for better understanding of the conclusions on vital subjects developed by the program.

The use of the Vidifont system



Fig. 1 A mix of upper and lower case letters enabled NET to super any kind of length or title in real-time over a participant or commentator.

its planned location on the screen. Each page (title) ran in show sequence. The operator set up the font size, typed and centered the text from his keyboard, and stored the information in a selected group of address locations. Each title was

given a number and worked into the director's script. When a title was needed, a number was called, the operator pressed two buttons, and the title appeared on the studio switcher for immediate insertion by the director.

System Flexibility
During the broadcast, every form and type of title was utilized. Panel members had from one to three line supers. Dates were inserted over video segments shot months before. The live commentator read messages as they were rolling up the screen with certain key words colored and flashing for greater emphasis. At the director's request, titles were changed and rearranged out of the original sequence. And not a single piece of "hot press," title cards menu boards or slides were used during the production.

The Vidifont system has the capability of producing a 62 character set, 28 video scan lines high, with upper and lower case and full punctuation. An additional set of 64 upper case characters, 18 scan lines high, permits the studio operator to display on demand up to 10 or 12 rows of information, with a maximum of 50 characters per row. Special font styles can be designed and changes made in the field to implement them.

Slides and supers which cost up to five dollars to produce with conventional methods can be done instantly without special preparation or processing. Any message, properly composed and stored, can be re-shown not only in a full page mode, but also in roll (bottom to top) or crawl (right to left).

Standard two speed roll and crawl, with word-by-word color in six hues plus black and white, and automatic tabs and centering are available.

Magnetic storage devices, which permanently retain broadcast material from week to week and longer, allow any recorded information to be recalled by an address for display. Storage capacity of 800-9600 display rows are available. Any row or page of titles can be aired immediately by pressing four address keys and a "READ" button. The memory automatically advances from one address to the next as each message is recalled. A whole program can be aired by pushing

Fig. 2 Vidifont system is operated by a typist who punches out programming information as needed.

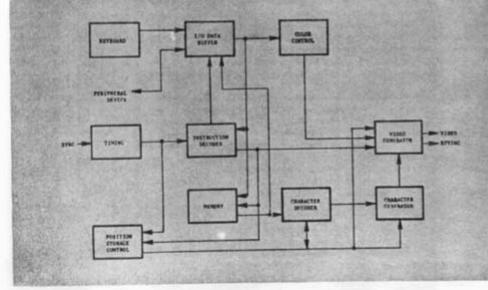


Fig. 3 The block diagram of the Vidifont character generation system for TV titling depicts adaptability to real-time demands.

BROADCAST ENGINEERING

only two buttons—at the operator's speed.

Basic System Functions

The compact Vidifont system provides four basic functions: Interface, Timing and Control, Storage, and Character Generation provided on 17 subsystem logic cards.

The Interface provides access to and from the basic Vidifont and its keyboard and peripheral devices.

The Timing and Control subsystem provides the basic timing and generates the necessary internal command lines and instructions to sync properly the characters generated with the display, to provide proper format of video output, and to provide basic timing comparisons.

The Storage subsystem is the Memory itself. The Memory consists of circulating shift registers with eight bits of character storage provided per character word, up to 50 character words permitted per row, and 12 or 16 rows of complete storage depending on the system configuration.

The Character Generation information is stored in dynamic recirculating MOS shift registers which are utilized as a controlled delay line. One single Memory package is equivalent to 600 transistor stages, dissipates approximately one milliwatt per stage, and costs less than one cent per transistor.

In addition to the enhancement of special events coverage with the use of Vidifont, the system drastically reduces costs as it increases efficiency. If the average station pays only \$75 per day, including manpower and materials, to produce titles by special art and camera, it is faced with an annual expenditure of \$27,300 based on seven days a week usage. No special equipment is needed to make the system perform. The output is video. Vidifont, which can be switched like a camera without tying up a costly camera and crew, represents an entirely new state-of-the-art advance in electronic character generation for television. ▲

